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AUTHOR Bohn, Martin J.; And Others
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ABSTRACT

The results of a field test of a computer-assisted counseling system, conducted in a suburban high school are presented. Three questions were asked: (1) does the education and career exploration system function adequately? (2) does it effect students' vocational development? and (3) what reactions does it elicit from students, parents, counselors, and teachers? The system, designed to provide the student with information concerning his educational and occupational choices for use in post high school plans, has three programs: (1) introduction and vocational orientation; (2) educational orientation and (3) post high school educational search. The subjects were: (1) black and white; (2) male and female; and (3) college and non-college bound. An experimental group consisting of students who had used the system and a control group who were not exposed to the system were randomly selected. Results indicate that the system experience leads to higher vocational maturity. Also, it was used equally by black and white students and by college and non-college bound students. Male students used the system more frequently than female students. Generally, the students were positive about their experience with the system, as were their parents. The counselors agreed on the potential contributions of the system but urged the use of other occupational materials. (RSM)

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THE EDUCATIONAL AND CAREER EXPLORATION SYSTEM:

FIELD TRIAL AND EVALUATION*

Martin J. Bohn, Jr., Richard H. Lindeman,
and Donald E. Super

Teachers College, Columbia University

In system development the strength of the logic, the completeness and accuracy of programs and routines, and the proven laboratory performance of equipment are usually not sufficient to justify the system. One must ultimately ask: "Does it work in the setting for which it was intended?" This paper presents the results of a field test of a computer-assisted counseling system, conducted in a suburban high school. The questions asked were: Does the system function adequately? Does it affect students' vocational development? What reactions does it elicit from students, parents, counselors, and teachers?

The System

The Educational and Career Exploration System (ECES) has its theoretical basis in vocational development theory. As an individual matures, he passes through life stages which are characterized by mastery of tasks usually expected of people in these stages. During the Growth and Exploration stages, the individual is engaged in learning about himself and trying new experiences to determine the kind of person he wishes to be (Super, 1957). Some of the decisions made during this time have far-reaching implications for his educational and occupational future. To make the best decisions for himself, the individual must know himself, must know something about the occupational world and its demands, and must know something about the relationship between his characteristics and those required by occupations.

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ECES was developed within this rationale, with an emphasis on exploration for the individual (Bohn & Super, 1969; Minor, Myers, & Super, 1969). It was decided that the system should deal primarily with the exploratory phase, be appropriate for varying socioeconomic and readiness levels and be under the control of the student, permitting the student and the system to work in an interactive mode. The system was designed to provide the student with information, to help him see the implications of his educational and occupational choices, and to supply data for use in post-high school plans, either in further education or in the world of work. Thus, students should come to the counselor ready to work at a higher level of decision making. Also, the system could serve as a comprehensive, up-to-date library of personally relevant occupational information.

The system itself was comprised of the following components: a film image display unit, a numeric keyboard, a typewriter printer, and a reference manual. The first three components were connected to a computer at a remote site. The programs in the system were divided into three main sections: I. Introduction and Vocational Orientation; II. Educational Orientation; and III. Post-High School Educational Search.

Design of the Study

The design of the study called for the system to be installed in a high school and to be made available to students. After use by the students, attempts would be made to assess the effects of the system on the students' vocational development and to assess the reactions of people in contact with the system (Thompson, Lindeman, Clack, & Bohn, 1970). The field trial was conducted in The Montclair, New Jersey, High School, a comprehensive high school serving grades 9 through 12 and having an ethnically and socioeconomically heterogeneous population of 2,300 students. The population from which the subjects were drawn included the four grades of the high school, both sexes,

black and white races, and college and non-college bound students. A stratified random sample yielded an experimental and a control group. The experimental group consisted of students who had the opportunity to try the different phases and routines of the system. Control subjects were similar to the experimentals, but were not exposed to the system. The composition of these groups is shown in Table 1.

Table 1

Initial Samples of Experimental and Control Students Classified by Grade, Sex, Race, and Post-high School Plans

	Grade				Sex		Race		Post-high Sch. Plans	
	9	10	11	12	Male	Female	White	Black	College	Non-college
Experimental	40	40	40	40	80	80	102	58	104	56
Control	40	40	40	40	80	80	102	58	104	56

Note: In subsequent analyses these numbers varied because of incomplete data.

Data obtained from these students included information about their school performance (e.g., grade point average), their aptitudes and interests, and their educational and occupational plans. The standardized testing was conducted before assignment was made to either the experimental or control groups. After the field trial period, appropriate measures were administered a second time, providing before and after comparison data. In addition, the experimental group responded to a questionnaire which solicited their reactions to the ECES experience. The experimental subjects routinely completed a student reaction form after each session on the system.

Results of the Study

The system was available to the students from March through May, 1969. During that time 156 students used the system, with the help of a system

monitor and a clerk from the guidance department. The results presented here describe use of the system, users of the system, effects on student vocational development, and students' reactions to the system. Reactions and opinions from parents, school counselors, and teachers are also reported.

How was the system used? Table 2 shows that white students and black students used the system about equally often, as did college bound and non-college bound students. Male students used the system more than did the female students (7.2 sessions vs. 6.3 sessions). Female, black, non-college students used the system less than any other group (an average of 4.5 sessions) and that male, non-college 9th and 10th grade students used it most (9.4 sessions). Also, 12th grade students had a lower average number of sessions than did the other grades (5.7 sessions). This lower utilization by 12th graders was probably because the final section of ECES, Post-High School Educational Search, which would have been most useful to high school seniors planning to go to college, was introduced late in the academic year.

Table 2

Mean Student Usage of ECES by Grade, Ethnic Background, Future, Education Plans, and Sex (N=156)

	Grade				Ethnic Background		Future Ed. Plans		Sex	
	9	10	11	12	White	Black	College	Non-college	Male	Female
N	42	39	41	34	100	56	102	54	78	78
Mean	7.7	6.7	6.8	5.7	7.0	6.3	6.8	6.4	7.2	6.3

ECES usage and vocational development. Using data in the pre- and post-trial student questionnaires, several measures of vocational maturity were developed and refined. These were:

1. Vocational and Educational Planning Maturity (M)
2. Knowledge of Decision-Making Principles (DP)

3. Amount of Decision-Making Information (DI1)
4. Amount of Decision-Making Information (DI2)
5. Quality of Decision-Making Information (DI3)
6. Acceptance of Responsibility for Decisions (RD)

Covariance analyses were used to compare the experimental and control groups on the post-test data, using pre-trial data as covariates. The general hypothesis was that as a result of ECES experience, the experimental students would score higher than the control groups on the measures of vocational maturity.

Scores on the Amount of Decision-Making Information (DI1), information the student believes he knows, were consistent with the hypothesis. Experimental students showed a greater increase on that scale than did the control students. The scores are shown in Table 3. No significant differences between experimental and control subjects were found on the other scales.

Table 3

Pre- and Post-Trial Means for Experimental and Control Subjects on DI1 Scale

Group	N	Pre-Trial Mean	Post-Trial Mean	SD	F
Experimental	125	36.19	43.55	9.03	10.59*
Control	122	37.45	39.64	9.47	

* with 1 and 214 d.f., significant at .005 level. The F test is based on a 2^5 analysis of variance with independent variables: grade, sex, race, future plans, and treatment.

Other Measures. The experimental and control groups were also compared on measures of realism of vocational and educational self-concepts. Discrepancies on the Occupational Trait List scored for self, ideal self, best liked occupation, and least liked occupation were used to test the hypotheses that experimental

students would have more realistic self concepts, vocational and educational, than would control students. The differences between the two groups were negligible, producing no support for the hypothesis that three months use of ECES had any effect on these variables.

Similar results were found on the Rotter Internalism-Externalism Scale, the Super Work Values Inventory, and the Holland Vocational Preference Inventory, although significant differences between certain subgroups were found on these scales. For example, on the Economic Returns value there was a significant interaction between treatments and post-high school plans. Among the experimental college-bound students' scores on this value increased while those of non-college-bound students decreased; in the control group college-bound students' scores remained the same while the non-college-bound showed a decrease. Significant differences involving treatment effects were found on three Holland vocational preference scales (Realistic, Conventional, and Enterprising). These results had not been hypothesized and did not fit readily into any theoretical framework. In general, then, it was not established that ECES experience tended to modify individuals' scores on these standard measures.

Student Reactions to ECES. At the completion of the field trial the experimental students were given a questionnaire to ascertain their reactions to and their opinions of ECES. Questions were asked about their experiences with ECES, their evaluations of the experience, their opinions about the usefulness of the system, and their suggestions about future developments of the system. The responses were first analyzed for the entire group, and then according to the major variables of grade, sex, race, and post-high school plans.

Students were generally positive about their experience with ECES. A majority of them believed that the system had lived up to their expectations and that the system could benefit all kinds of students. They found ECES helpful in their occupational and educational planning; it helped make them

aware of some occupational alternatives as well as important factors in occupational decisions. They agreed less about the helpfulness of ECES in understanding factors in their educational planning.

The students expressed a preference for a guidance program which incorporates both ECES and counselors. In the thinking of the students, ECES could not replace the counselor; however, there were activities which students believed could be better performed by ECES and other activities which could best be performed by the counselors. ECES was preferred for presenting facts about occupations, and information about occupational possibilities. The counselor was seen as superior in helping to integrate these facts. Also, the counselor was seen as superior when understanding of the student and his individual situation were needed. In a sense, these findings are consistent with the original plans and expectations for ECES. The system was designed to complement guidance programs and to serve as an aid to counselors, to help them work more effectively with their students. The students perceived this as a good way for ECES to be included in the programs as they know them. The students were obviously aware that the computer system cannot do all things that a counselor can do, although there are some functions that perhaps could best be taken care of by the ECES.

Differences in Attitudes. Among the subgroups of students there were some significant differences in the attitudes toward the system. The non-college-bound students, on the average, tended to report more helpfulness from the system than did the college bound. Non-college-bound reported that the system had more impact, that it was more helpful in gaining an understanding of their strengths and weaknesses, finding definite paths of action, and dealing with problems. More than the college bound group, these students reported feeling that the system tried to choose a major for them. In a similar way, black students more than white students found ECES more directive, particularly in

regard to choosing an occupation for them. The 9th and 10th graders generally found the system more helpful than did the 11th and 12th graders.

From the students' reactions it would seem that ECES is seen as more helpful by those students who typically have less information on which to make future plans, specifically the underclassmen, the blacks, and the non-college-bound students. It may be that ECES or a system like it is most appropriate for these students.

Parent Attitudes toward ECES

A questionnaire was mailed to all parents of the experimental students, asking them about discussions about ECES with their children, their opinions of the helpfulness of the system, and their activity in planning with their children. The parents responding, either by mail or by interview represented approximately 70% of the families. The interviewed sample showed that the nonrespondents were different from the respondents mainly in that they discussed ECES less with their children, and they were less involved with the guidance programs or the counselors in the schools. The nonrespondent parents reported that their children had received more help from ECES than did the respondent parents.

The general reaction of the parents to ECES was positive and enthusiastic. The parents felt that the system had value and could be of use in the vocational and educational planning of their children. Parents of white, college-bound, male students were perhaps least enthusiastic, feeling that their children had ~~gained~~ little new knowledge from ECES.

A comparison between parents in the upper levels (e.g., accountants, engineers, and physicians), and in the lower levels (bookkeepers, foremen, and mechanics) showed that those in the lower levels were more positive about the effects of ECES. They reported receiving more help in seeing connections

between high school and future plans, between interests and vocations, seeing new occupational and educational possibilities, making good decisions.

Counselors and ECES

Counselors from the school became familiar with the system in the laboratory, and in the school, before any students were enrolled in the experiment. To assess the effects ECES might have on the work of the counselors, and to find out their reactions to the effects which they perceived in their students, the counselors cooperated by completing a questionnaire before the field test, keeping a log during the test, and participating in a group interview on their opinions and reactions after the field test.

The Pretest Questionnaire reflected the counselors' opinion that students often make their plans on the basis of limited information, without a good working knowledge of the demand for people in occupations they were considering, and little actual working experience in these occupations. The counselors believed that there is not enough time for them to work with their students and that they could work more effectively with the students if the latter had more and better information. The counselors were unanimous in their agreement that there should be more educational and career guidance.

On the Counselor Interaction Logs there was little difference between interviews with experimental and control students. The major activity of the interviews was giving information, and most interviews moved in the direction of expanding the alternatives being considered by the students. The control groups received higher ratings on their use of the counselors' time and the students' progress in thinking about the future. This suggests the need for further study of system effects on student-counselor relationships, especially over a longer time span.

In the group interview with the counselors, they indicated having maintained a "hands off" attitude in regard to the system since this had been a field test.

Because of this attitude, the counselors minimized their discussion of the system with students, although they did have some definite reactions and recounted specific incidents of student impact of the system. Their students had reported having specific interests awakened after being on the system. Some students had begun the program with explicit negative attitudes and in the process of the test reversed their attitudes. In the records of one counselor who had kept his student contacts, more than half of the students using the system made significant changes in their occupational plans, changes in the direction of more appropriate levels of education or wiser choices of occupational goals.

The counselors reported a general increase in the use of other available occupational material available in their departmental library, among both experimental and control students. Counselors were able to see the potential contributions such a system could make to a school guidance program. It is perhaps with counselors that most work must be done to effectively introduce a computer-assisted guidance system into the schools.

References

Bohn, M.J. Jr., & Super, D.E. The computer in counseling and guidance programs. Educational Technology, 1969, 9, 29-32.

Minor, F.J., Myers, R.A., & Super, D.E. An experimental computer-based educational and career exploration system. Personnel and Guidance Journal, 1969, 47, 564-569.

Super, D.E. The psychology of careers. New York: Harper, 1957.

Thompson, A.S., Lindeman, R.H., Clack, Sylvia, & Bohn, M.J. Jr. The Educational and Career Exploration System: Field trial and evaluation in Montclair High School. New York: Teachers College, Columbia University, 1970. (Mimeo)